



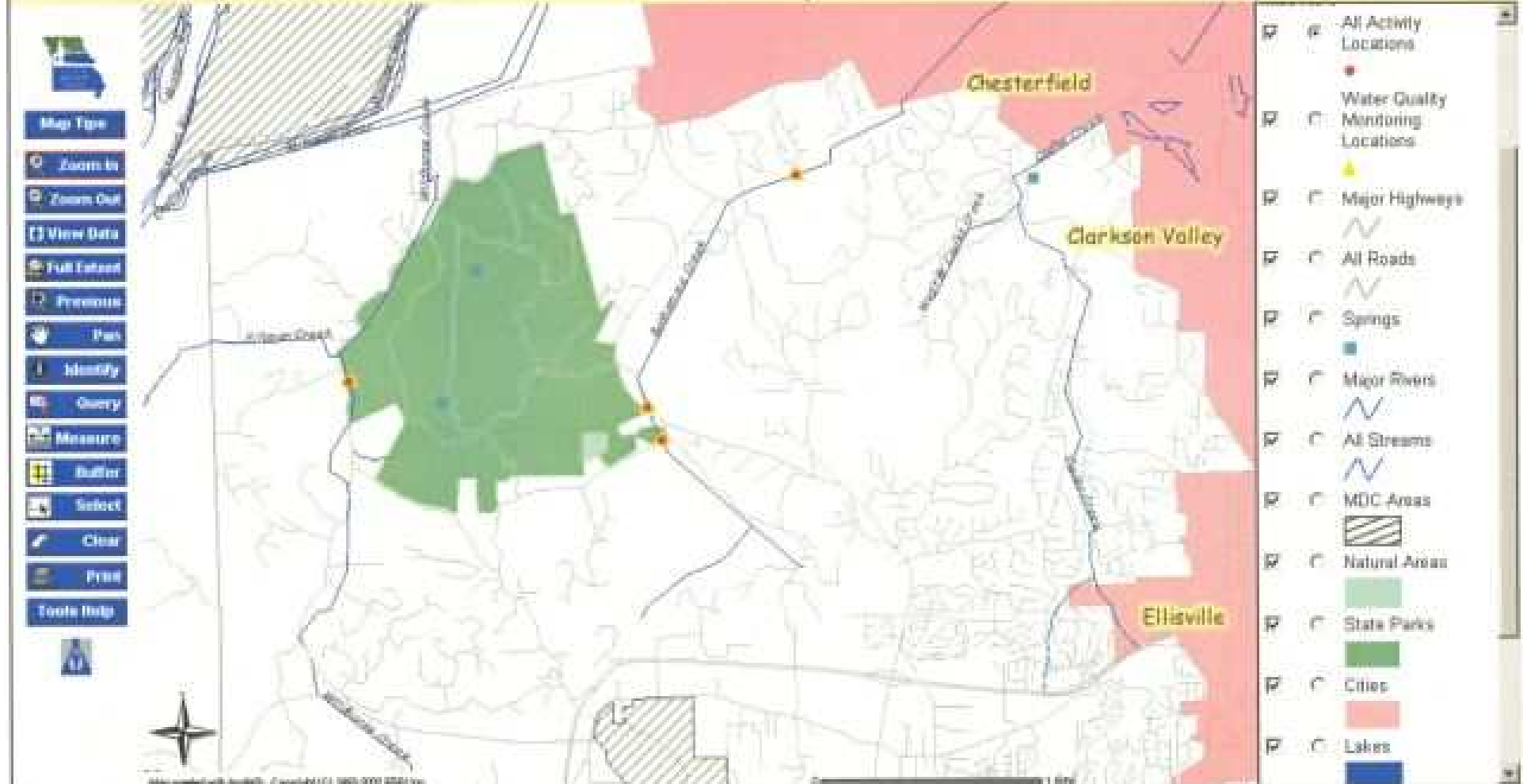
SITE SELECTION AND IDENTIFICATION

Reasons Volunteers Have Chosen a Site

- To learn the condition of a stream on their property or in their neighborhood
- Concern about their favorite fishing or floating stream
- Concern about a point or nonpoint source discharge
- Stream is of concern to state agencies
- To fill a gap in the current monitoring effort

Missouri Stream Team

Activity Locations



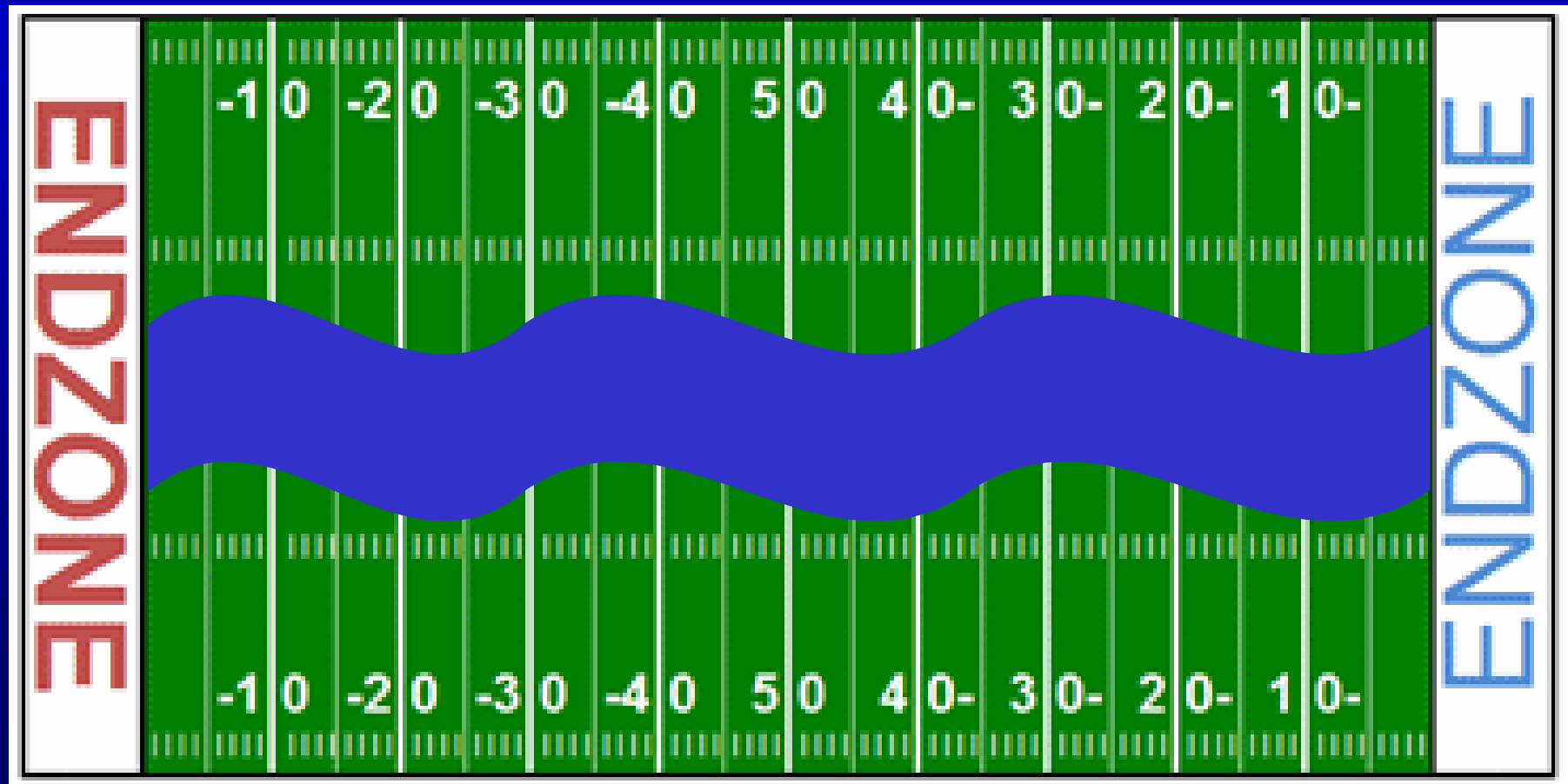
Zoom In

Questions or comments? Please e-mail [Stream Team](#)

MONITORING SITE

- Site Definition:
 - A 300-foot (100-yard) section containing at least one **riffle**
- A riffle is:
 - Portion of the stream characterized by a steep descent in the streambed and where the water breaks over rocks and/or boulders
- Individual sites should not overlap

HOW LONG IS 300 FEET?







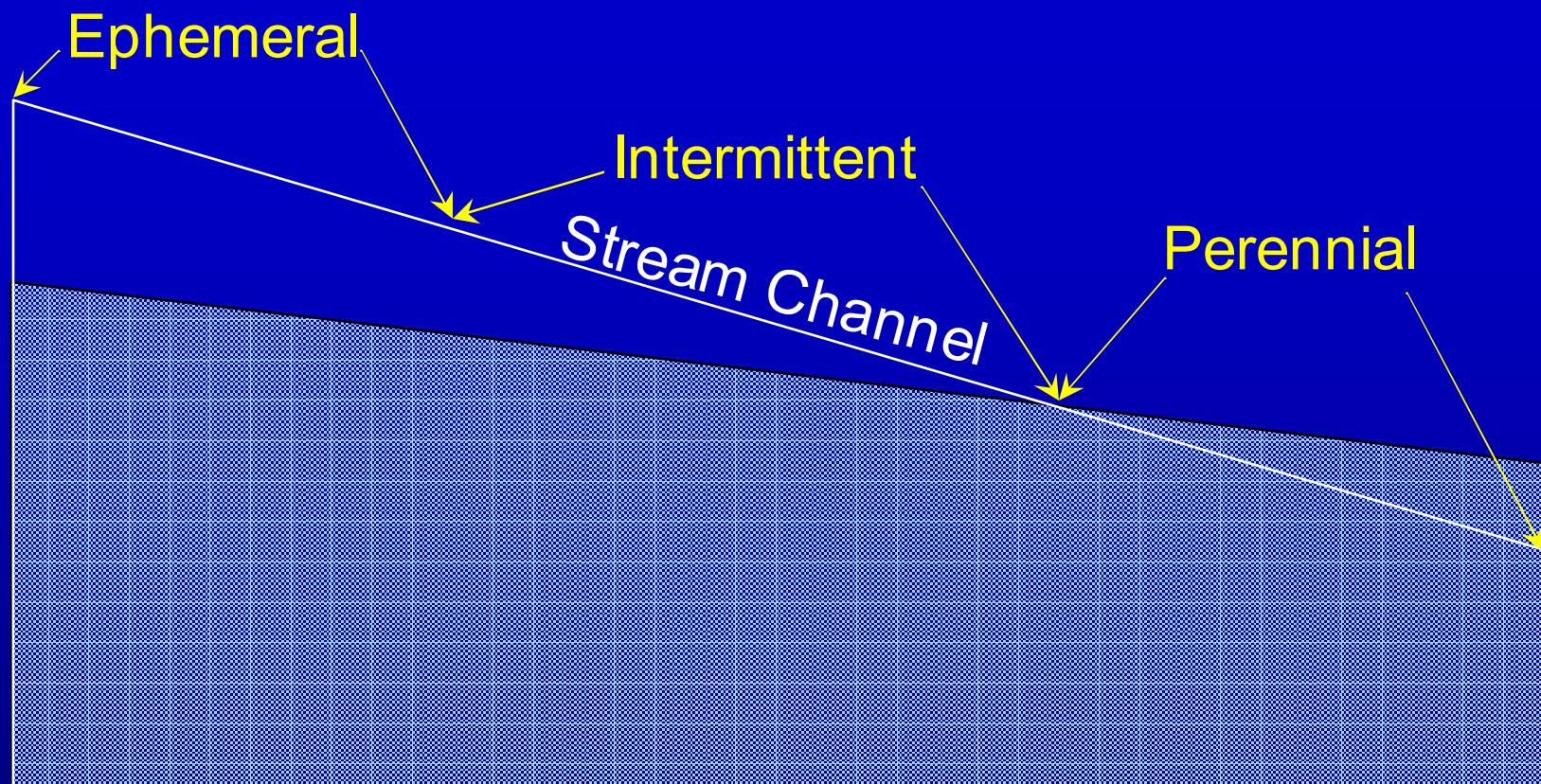


Factors to Consider When You Select a Monitoring Site

- Select a stream that has permanent flow (i.e., a classified stream)
 - If the stream at your site pools in dry periods of the year you may still monitor in spring and fall
 - If the stream consistently dries up at your site anytime during the year you will need to select another site

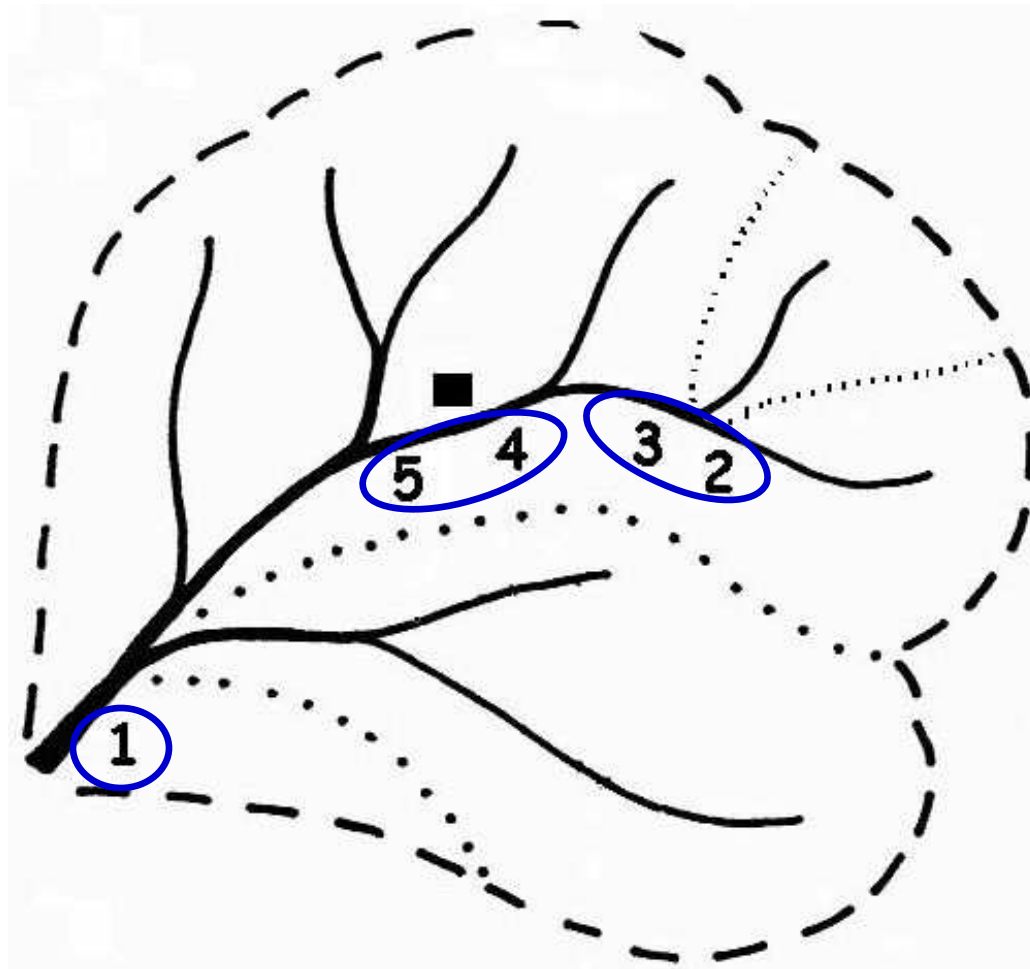
Factors to Consider When You Select a Monitoring Site

- Find a site with suitable habitat for macroinvertebrates, a riffle running over rocky substrate (or alternative habitats)
- Choose a site based on your monitoring goals
- Presence of point and nonpoint source discharges



Factors to Consider When You Select a Monitoring Site

- Access/permission from the landowner to monitor
 - Always ask permission!
 - If you want to monitor on public land always ask permission from the area manager
- Where do tributaries enter the stream?



SITE 1

Sample at the mouth to determine the health of the entire watershed

SITES 2 & 3

Sample above and below the confluence of a tributary to determine the impacts on water quality that may be occurring within the tributary's watershed

SITES 4 & 5

Sample above and below point or nonpoint source discharges to determine impacts on water quality

Site Numbering

Consecutively (chronologically) number your sites as you adopt them, beginning with #1

- **Site #1 will always be your only Site #1**
 - ▶ Even if you switch streams
 - ▶ Even if you stop monitoring this site

Site Numbering (cont.)

If you abandon a monitoring site, **DO NOT** transfer the abandoned site's number to another site you've begun to monitor

- If you add a second site, even on a different stream, call that Site #2
- **Always use the same site number for a particular location**

Site Identification

Site Description

Always use the same verbal description every time you send in data on this site. Use a description that will enable staff to locate your site on a map.

- Describe your site using
 - ▶ Street or highway names
 - ▶ Upstream or downstream of bridges
 - ▶ Major intersections
 - ▶ Distances from those landmarks

Example: Gruener's Ford, 100 feet upstream of Hwy P bridge

Site Selection Data Sheet

SITE SELECTION DATA SHEET	
<i>If this is a new site, please check the box next to "Site #" and be sure to attach a map.</i> <input type="checkbox"/> Site # _____ Stream _____ County _____ Site Description _____ Date _____ Trained Data Submitter (person assuming responsibility for these data) _____ Trained Data Submitter's Stream Team Number _____ Rainfall (inches in last 7 days) _____ Trained Participants _____	
Weather Conditions: <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Rain Other: _____	
Temperature: Air Temperature (°C) _____ Water Temperature (°C) _____	
Water Appearance: <input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Milky <input type="checkbox"/> Oily Other: _____	
Water Odor: <input type="checkbox"/> Rotten <input type="checkbox"/> Musty <input type="checkbox"/> Fishy <input type="checkbox"/> Chlorine <input type="checkbox"/> None Other: _____	
Habitats: (Check all that apply) <input type="checkbox"/> Pool <input type="checkbox"/> Root Wads <input type="checkbox"/> Undercut Banks <input type="checkbox"/> Riffle <input type="checkbox"/> Logs or Stumps <input type="checkbox"/> Rock Ledges <input type="checkbox"/> Run <input type="checkbox"/> Aquatic Vegetation <input type="checkbox"/> Log Piles <input type="checkbox"/> Backwater <input type="checkbox"/> Large Boulders <input type="checkbox"/> Artificial Objects Other: _____	
Riparian Cover: Stream is ... <input type="checkbox"/> Fully exposed (0-25% of stream is shaded from the sun) <input type="checkbox"/> Partially Exposed (25-50%) <input type="checkbox"/> Partially Shaded (50-75%) <input type="checkbox"/> Fully Shaded (75-100%)	
Vegetation: <input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses/Weeds <input type="checkbox"/> Root Mats (Check all that apply) <input type="checkbox"/> Bare Ground Other: _____	
Algae: Is the algae located: <input type="checkbox"/> In Spots <input type="checkbox"/> Everywhere <input type="checkbox"/> Absent Is the algae: <input type="checkbox"/> Close-Growing (< 2") <input type="checkbox"/> Filamentous (> 2") Other: _____	
Stream Bed: (Rank each substrate 0-5 with 5 being most prevalent.) Silt/Mud <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Sand <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Gravel <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Cobble <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Bedrock <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5	
Aquatic Organisms: <input type="checkbox"/> Fish <input type="checkbox"/> Invertebrates Other: _____	
Land Use in the Watershed: (Check all that apply) <input type="checkbox"/> Pasture/Grazing Land <input type="checkbox"/> Cropland <input type="checkbox"/> Woods <input type="checkbox"/> Park <input type="checkbox"/> Homes <input type="checkbox"/> Factories <input type="checkbox"/> Stores <input type="checkbox"/> Confined Animal Feeding Operation (CAFO) Other: _____	

Information Needed on All Data Sheets

Processing of your data will be delayed if any of these *6 pieces* of information are missing from your data sheets

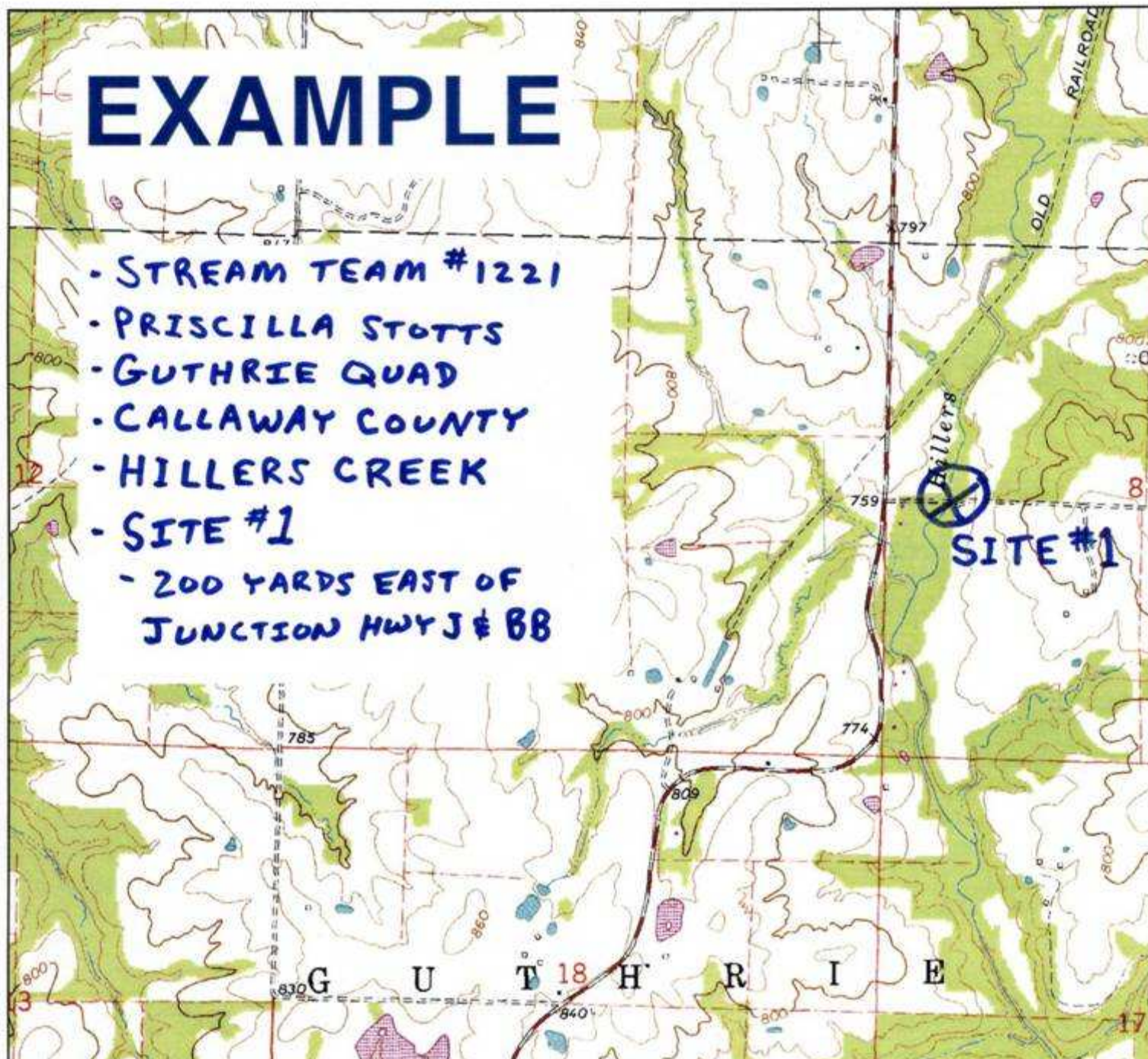
- Stream name
- Site description
- Site number
- Trained data submitter
- Stream Team number
- Date sampled

Site Map

- 1st time at a new site, include a copy of a topo map with new site clearly marked and numbered
- Data submitted without a map will delay processing
- We recommend you locate any new site on the map before sampling

EXAMPLE

- STREAM TEAM #1221
- PRISCILLA STOTTS
- GUTHRIE QUAD
- CALLAWAY COUNTY
- HILLERS CREEK
- SITE #1
- 200 YARDS EAST OF JUNCTION HWY J & BB



What to do if the Name of Your Stream is Not on the Topo Map

- Most intermittent streams are not named on the topos.
- Sometimes a stream is incorrectly identified as intermittent on the topo, when it actually has some water year round.

What to do if the Name of Your Stream is Not on the Topo Map

- Sometimes the stream name is left off the map because it was too long.
- Sometimes they have not been officially named even though there may be a local name for it.

GPS Information

- Have a GPS unit? Want to report these coordinates?
- **PLEASE** complete a GPS Site Location Data Sheet and send it in with your data
- This does **NOT** replace an accurate verbal description

GPS Data Sheet

- Header Info
- GPS make and model
- WAAS enabled?
- Datum
 - NAD 1983 preferred
- Stabilizing time
 - 120 second minimum (2 minutes)
 - Position Error <25 ft.

GPS DATASHEET		
Fields with an asterisk (*) are required fields. Please provide Coordinates in either Latitude/Longitude or UTM's.		
*1. Stream Name: _____	County: _____	
*2. Site Description: _____		
*3. Team Number: _____	*4. GPS Data Submitter: _____	
*5. Site Number: _____	*6. Date: ____/____/____	*Time (24hr): _____
GPS RECEIVER INFORMATION		
*7. GPS Make and Model: _____		
8. Wide Angle Augmentation System (WAAS) Enabled: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		
DATUM		
*9. Horizontal Datum: <input type="checkbox"/> North American Datum (NAD) 1927 <input type="checkbox"/> World Geodetic Survey (WGS) 1984		
<input type="checkbox"/> North American Datum (NAD) 1983 <input type="checkbox"/> Other: _____		
POSITION ERROR INFORMATION		
10. Stabilizing Time (in seconds): _____ <input type="checkbox"/> WAAS Averaging		
11. Estimated Position Error (EPE): _____ <input type="checkbox"/> Feet <input type="checkbox"/> Meters <input type="checkbox"/> Not Available		
COORDINATES - LATITUDE AND LONGITUDE OPTION (preferred option)		
12. Latitude: _____ N		
13. Longitude: _____ W		
14. Format: <input type="checkbox"/> Degrees Minutes Seconds (ddd° mm' ss.s") <input type="checkbox"/> Decimal Minutes (ddd° mm.mm'm')		
<input type="checkbox"/> Decimal Degrees (ddd.ddddd") (preferred format) <input type="checkbox"/> Other: _____		
COORDINATES - UNIVERSAL TRANSVERSE MERCATOR (UTM) OPTION		
15. Easting: _____		
16. Northing: _____		
17. UTM Zone: <input type="checkbox"/> Zone 15 <input type="checkbox"/> Zone 16		
COMMENTS: _____		
PLEASE KEEP A COPY AND SEND ORIGINAL TO: Water Protection Program Department of Natural Resources P. O. Box 176 Jefferson City, MO 65102-0176		
Volunteer Monitoring - 05/08		



Setup - Preferences

- Set Setup/Map/Orientation = “North Up”
- Set Units/Position/Format =
“hddd.ddddd”
- Set Units/Map/Datum = “NAD83”
- Set System/WAAS = “Enabled”

GPS Data Submission

•Instructions on the back of form

GPS DATA SHEET INSTRUCTIONS

Please read the following descriptions before filling out this sheet. All fields with an asterisk (*) are **required fields**. Please note that Latitude/Longitude in Decimal Degrees (ddd.ddddd°) are the preferred coordinates, but Universal Transverse Mercator (UTM) coordinate systems may also be used. Due to the technical complexity of Global Positioning Systems and Geographic Information Systems, proper completion of these fields is necessary to establish an exact location. If these fields are not completed, the program cannot use your GPS data. **This sheet does not replace the map of your site.** If you have not already done so, you will still need to send a map.

The Data Sheet Items

1. **Stream Name and County.** List the name of the stream as it appears on your map. Locating your site on a map also ensures you record the appropriate county.
2. **Description.** This refers to a verbal description of the site. Verbally describe where you are on a stream using street or highway names, bridges, approximate distances from landmarks, etc.
3. **Team Number.** This is the Stream Team number this data will be submitted under.
4. **GPS Data Submitter.** The person actually using the GPS receiver and recording the data.
5. **Site Number.** You and your team must designate this number. It becomes very important if you decide to monitor more than one site.
6. **Date and Time.** Please use military time (e.g. 2:00 p.m. is 1400 or 2:45 p.m. is 1445).
7. **GPS Make and Model.** Please provide the brand name of your GPS receiver (e.g., Garmin, Lowrance, Magellan, etc.) and the model if known (e.g., eTrex Vista, GlobalMap 100, Meridian Platinum, etc.).
8. **Wide Angle Augmentation System (WAAS) Enabled.** WAAS is an additional set of satellites, only one of which is "visible" from most areas in Missouri. If your GPS receiver is WAAS capable and this function is being used, check yes. If this is not available or not in use, check no. There is a checkbox available if you do not know.
9. **Horizontal Datum.** Next to the coordinates themselves, this is the most important piece of information to collect. Your GPS receiver displays where you are based on this reference. Without the horizontal datum, it is impossible to accurately place the coordinates on a map. This information can usually be found quite easily in the menu system of your GPS receiver. You may need to consult the user manual that came with your GPS receiver.
10. **Stabilizing Time.** The GPS receiver should be allowed to stabilize for at least two minutes. Enter the number of seconds the receiver was allowed to stabilize before the coordinates were recorded. Many receivers automatically do this and refer to it as the "averaging" time. Some receivers will include the averaging time of WAAS satellites. If WAAS averaging is obtained, check the box. To find these functions, you may need to consult the user manual that came with your GPS receiver. If this function is not available, record this using a wristwatch or stopwatch.
11. **Estimated Position Error.** Most consumer GPS receivers display a range of error known as Estimated Position Error. If this is available on your receiver, please record it and check the appropriate distance measurement. You may need to consult the user manual that came with your GPS receiver.

NOTE: You have the **OPTION** of using two coordinate systems, Latitude/Longitude **OR** Universal Transverse Mercator.

If using the latitude/longitude option

- 12 & 13. **Latitude and Longitude.** Enter coordinates in these fields **only** if using Latitude/Longitude option. While at your monitoring site, enter the latitude and longitude coordinates displayed on your GPS receiver, copying the exact coordinates in the displayed format (see Item 14 below).
14. **Format.** Check the box that represents the Latitude/Longitude coordinate format you are using. If the GPS user does not know the coordinate format, this information can usually be found quite easily in the menu system of your GPS receiver. You may need to consult the user manual that came with your GPS receiver.

If using the Universal Transverse Mercator (UTM) option

- 15 & 16. **Easting and Northing.** Enter coordinates in these fields **only** if using UTM option. While at your monitoring site, enter the UTM coordinates exactly as they are displayed on your GPS receiver.
17. **UTM Zone.** Check the box for the UTM Zone number that is displayed on your GPS receiver.

Comments. Please include any conditions that may hinder the ability of your GPS receiver to receive data (e.g., dense clouds, heavy tree coverage, structures, etc.). If there is additional information from your GPS receiver that may be helpful to us, such as different stabilizing time or position error measurements, please include them in this field. Please include any other information that we may find helpful.

Description Only

vs.

GPS Data

- Zoom to county
- Highlight stream
- Highlight road
- Identify place name (community, cemetery, bluff, spring, etc)
- Determine direction (upstream, downstream)
- Measure distance

- Enter GPS coordinates
- Zoom to coordinates
- Confirm with location description

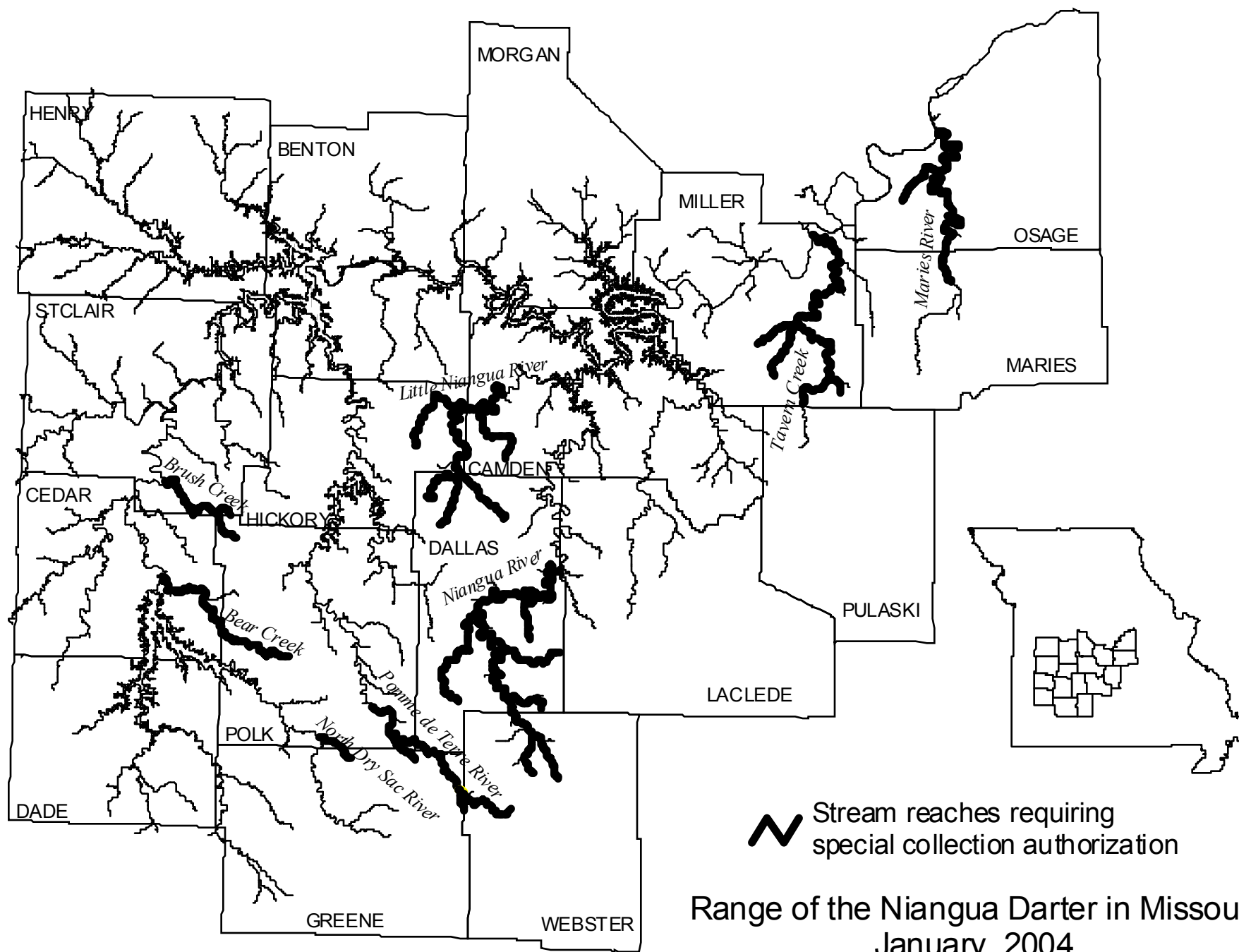
Why all the Attention to Site Locations?

When you think about it, if we don't know where your site is located, your data will not be useful to the program and to any others interested in your data in the future.

Endangered Species

- Niangua darters are a small fish that are listed as endangered by the U.S. Fish and Wildlife Service and the Missouri Dept. of Conservation.
- Because the Niangua darter spawns in riffles, kicking up macroinvertebrates can be detrimental to spawning.





**PLEASE DO NOT CONDUCT
MACROINVERTEBRATE MONITORING IN
THE FOLLOWING STREAMS FROM
MARCH 15 THROUGH JUNE 15**

Niangua R. Watershed

Niangua River

Greasy Creek

L Niangua River

L Niangua R. Watershed

Macks Creek

Starks Creek

Thomas Creek

Cahoochie Creek

Niangua Darter Streams

Sac River Watershed

Sac River
Bear Creek
Brush Creek
Panther Creek
North Dry Sac River

Tavern Creek Watershed

Tavern Creek
Barren Fork
Brushy Fork
Kenser Creek
Little Tavern Creek

Other Streams

Pomme de Terre River
South Fork Pomme de Terre River
Little Pomme de Terre River
Maries River
L Maries Creek